Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Previously Presented) A method comprising:

transmitting a first training symbol on a plurality of antennas,

wherein the first training symbol comprises a plurality of data symbols,

wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones, and

wherein each of the plurality of antennas transmits a corresponding one of the plurality of data symbols.

2. (Previously Presented) The method of claim 1, further comprising:

transmitting a second training symbol on the plurality of antennas,

wherein the second training symbol comprises the plurality of data symbols in the first training symbol, and

wherein each of the plurality of antennas transmits a different one of the plurality of data symbols than in the first training symbol.

3. (Previously Presented) The method of claim 2, wherein the first training symbol has a first pattern in which each of the plurality of antennas transmits one of the plurality of data symbols on a first subset of tones, and

wherein the second training symbol has a second pattern comprising a shifted pattern of the first pattern such that each of the plurality of antennas transmits a respective data symbol on a different subset of tones.

4. (Original) The method of claim 1, wherein the plurality of antennas comprises N antennas, and further comprising transmitting N-1 training symbols after the first training symbol.

5. (Original) The method of claim 4, further comprising: transmitting each of said training symbols at least two times.

6. (Original) The method of claim 1, further comprising: transmitting the first training symbol at least two times.

7. (Original) The method of claim 1, wherein the plurality of data symbols in the first training symbol are transmitted simultaneously on the plurality of antennas.

8. (Original) The method of claim 1, wherein each of the plurality of antennas transmits said corresponding ones of the plurality of data symbols on corresponding ones of the plurality of tones and transmits null symbols on the other tones.

9. (Original) The method of claim 1, wherein the first training symbol comprises an OFDM (Orthogonal Frequency Division Multiplexing) training symbol.

10. (Previously Presented) A method comprising:

receiving a first training symbol transmitted by a plurality of antennas,

wherein the first training symbol comprises a plurality of data symbols,

wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones, and

wherein each of the plurality of data symbols is received from a corresponding one of the plurality of antennas; and

in response to at least the first training symbol, determining a gain at each of the plurality of antennas for each of the plurality of tones.

11. (Previously Presented) The method of claim 10, wherein said determining comprises:

for each of the plurality of antennas, interpolating values for a plurality of said tones from the corresponding plurality of data symbols received from said antennas.

12. (Original) The method of claim 10, wherein said plurality of antennas comprises N antennas, and

further comprising:

receiving N-1 training symbols after the first training symbol.

13. (Previously Presented) The method of claim 12, wherein each of the first and N-1 training symbols comprises the plurality of data symbols, and

wherein each of said training symbols has a corresponding pattern in which a different plurality of data symbols is transmitted on each of said plurality of antennas than in the other training symbols.

14. (Original) The method of claim 13, further comprising:

receiving each of the plurality of data symbols from each of the plurality of antennas.

15. (Original) The method of claim 14, wherein said determining comprises:

performing an inverse Fourier transform on the plurality of data symbols received from each of the plurality of antennas.

16. (Previously Presented) A preamble structure comprising:

a first training symbol comprising a plurality of data symbols,

wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones, and

wherein each of the plurality of data symbols is designated to be transmitted by a corresponding one of a plurality of antennas.

17. (Previously Presented) The preamble structure of claim 16, wherein said plurality of antennas comprises N antennas, and wherein the preamble structure further comprises:

N-1 training symbols in addition to the first training symbol,

wherein each of said training symbols comprises the plurality of data symbols, and

wherein each of said training symbols has a corresponding pattern in which each of the plurality of antennas transmits one of the plurality of data symbols over a different subset of tones than in the other training symbols.

18. (Original) The preamble structure of claim 17, wherein the preamble structure comprises a preamble structure for an N X N multiple-in-multiple-out (MIMO) system.

19. (Original) The preamble structure of claim 16, wherein the training symbols comprise Orthogonal Frequency Division Multiplexing (OFDM) training symbols.

20. (Previously Presented) An apparatus comprising:

a training module operative to transmit a first training symbol on a plurality of antennas,

wherein the first training symbol comprises a plurality of data symbols,

wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones, and

wherein each of the plurality of antennas transmits a corresponding one of the plurality of data symbols.

21. (Previously Presented) The apparatus of claim 20, wherein the training module is further operative to transmit a second training symbol on the plurality of antennas,

wherein the second training symbol comprises the plurality of data symbols in the first training symbol, and

wherein each of the plurality of antennas transmits a different one of the plurality of data symbols than in the first training symbol.

22. (Previously Presented) The apparatus of claim 21, wherein the first training symbol has a first pattern in which each of the plurality of antennas transmits one of the plurality of data symbols on a first subset of tones, and

wherein the second training symbols has a second pattern comprising a shifted pattern of the first pattern such that each of the plurality of antennas transmits a respective data symbol on a different subset of tones.

23. (Original) The apparatus of claim 20, wherein the plurality of antennas comprises N antennas, and wherein the training module is further operative to transmit N-1 training symbols after the first training symbol.

24. (Original) The apparatus of claim 23, wherein the training module is further operative to transmit each of said training symbols at least two times.

25. (Original) The apparatus of claim 20, wherein the training module is further operative to transmit the first training symbol at least two times.

26. (Original) The apparatus of claim 20, wherein the training module is further operative to transmit the plurality of data symbols in the first training symbol simultaneously on the plurality of antennas.

27. (Original) The apparatus of claim 20, wherein for each of the plurality of antennas, the training module is further operative to transmit said corresponding ones of the plurality of data symbols on corresponding ones of the plurality of tones and transmit null symbols on the other tones.

28. (Original) The apparatus of claim 20, wherein the first training symbol comprises an OFDM (Orthogonal Frequency Division Multiplexing) training symbol.

29. (Previously Presented) An apparatus comprising:

a training module operative to receive a first training symbol transmitted by a plurality of antennas,

wherein the first training symbol comprises a plurality of data symbols,

wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones, and

wherein each of the plurality of data symbols is received from a corresponding one of the plurality of antennas; and

in response to at least the first training symbol, determine a gain at each of the plurality of antennas for each of the plurality of tones.

30. (Previously Presented) The apparatus of claim 29, wherein for each of the plurality of antennas, the training module is operative to interpolate values for a plurality of said tones from the corresponding plurality of data symbols received from said antenna.

31. (Original) The apparatus of claim 29, wherein said plurality of antennas comprises N antennas, and

wherein the training module is further operative to receive N-1 training symbols after the first training symbol.

32. (Previously Presented) The apparatus of claim 31, wherein each of the first and N-1 training symbols comprises the plurality of data symbols, and

wherein each of said training symbols has a corresponding pattern in which each of the plurality of antennas transmits one of the plurality of data symbols over a different subset of tones than in the other training symbols.

33. (Original) The apparatus of claim 32, wherein the training module is further operative to receive each of the plurality of data symbols from each of the plurality of antennas.

34. (Original) The apparatus of claim 33, wherein the training module is further operative to perform an inverse Fourier transform on the plurality of data symbols received from each of the plurality of antennas.

35. (Previously Presented) An apparatus comprising:

means for transmitting a first training symbol on a plurality of antennas,

wherein the first training symbol comprises a plurality of data symbols,

wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones, and

wherein each of the plurality of antennas transmits a corresponding one of the plurality of data symbols.

36. (Previously Presented) The apparatus of claim 35, further comprising:

means for transmitting a second training symbol on the plurality of antennas,

wherein the second training symbol comprises the plurality of data symbols in the first training symbol, and

wherein each of the plurality of antennas transmits a different one of the plurality of data symbols than in the first training symbol.

37. (Previously Presented) The apparatus of claim 36, wherein the first training symbol has a first pattern in which each of the plurality of antennas transmits one of the plurality of data symbols on a first subset of tones, and

wherein the second training symbol has a second pattern comprising a shifted pattern of the first pattern such that each of the plurality of antennas transmits a respective data symbol on a different subset of tones.

38. (Original) The apparatus of claim 35, wherein the plurality of antennas comprises N antennas, and further comprising transmitting N-1 training symbols after the first training symbol.

39. (Original) The apparatus of claim 38, further comprising: means for transmitting each of said training symbols at least two times.

40. (Original) The apparatus of claim 35, further comprising: means for transmitting the first training symbol at least two times.

41. (Original) The apparatus of claim 35, wherein the plurality of data symbols in the first training symbol are transmitted simultaneously on the plurality of antennas.

42. (Original) The apparatus of claim 35, wherein each of the plurality of antennas transmits said corresponding ones of the plurality of data symbols on corresponding ones of the plurality of tones and transmits null symbols on the other tones.

43. (Original) The apparatus of claim 35, wherein the first training symbol comprises an OFDM (Orthogonal Frequency Division Multiplexing) training symbol.

44. (Previously Presented) A apparatus comprising:

means for receiving a first training symbol transmitted by a plurality of antennas,

wherein the first training symbol comprises a plurality of data symbols,

wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones, and

wherein each of the plurality of data symbols is received from a corresponding one of the plurality of antennas; and

means for determining a gain at each of the plurality of antennas for each of the plurality of tones in response to at least the first training symbol.

45. (Previously Presented) The apparatus of claim 44, wherein said means for determining comprises:

means for interpolating values for a plurality of said tones from the corresponding plurality of data symbols received from said antenna for each of the plurality of antennas.

46. (Original) The apparatus of claim 44, wherein said plurality of antennas comprises N antennas, and

further comprising:

means for receiving N-1 training symbols after the first training symbol.

47. (Previously Presented) The apparatus of claim 46, wherein each of the first and N-1 training symbols comprises the plurality of data symbols, and

wherein each of said training symbols has a corresponding pattern in which each of the plurality of antennas transmits one of the plurality of data symbols over a different subset of tones than in the other training symbols.

48. (Original) The apparatus of claim 47, further comprising:

means for receiving each of the plurality of data symbols from each of the plurality of antennas.

49. (Original) The apparatus of claim 48, wherein said means for determining comprises:

means for performing an inverse Fourier transform on the plurality of data symbols received from each of the plurality of antennas.

50. (Currently amended) A computer program product, tangibly embodied in a machine-readable storage device, the computer program product being operable to cause data processing apparatus to perform operations comprising:

transmitting a first training symbol on a plurality of antennas,

wherein the first training symbol comprises a plurality of data symbols,

wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones, and

wherein each of the plurality of antennas transmits a corresponding one of the plurality of data symbols.

51. (Currently amended) The computer program product of claim 50, further comprising:

transmitting a second training symbol on the plurality of antennas,

wherein the second training symbol comprises the plurality of data symbols in the first training symbol, and

wherein each of the plurality of antennas transmits a different one of the plurality of data symbols than in the first training symbol.

52. (Currently amended) The computer program product of claim 51, wherein the first training symbol has a first pattern in which each of the plurality of antennas transmits one of the plurality of data symbols on a first subset of tones, and

wherein the second training symbols has a second pattern comprising a shifted pattern of the first pattern such that each of the plurality of antennas transmits a respective data symbol on a different subset of tones.

53. (Currently amended) The computer program product of claim 50, wherein the plurality of antennas comprises N antennas, and further comprising transmitting N-1 training symbols after the first training symbol.

54. (Currently amended) The computer program product of claim 53, further comprising:

transmitting each of said training symbols at least two times.

55. (Currently amended) The computer program product of claim 50, further comprising:

transmitting the first training symbol at least two times.

56. (Currently amended) The computer program product of claim 50, wherein the plurality of data symbols in the first training symbol are transmitted simultaneously on the plurality of antennas.

57. (Currently amended) The computer program product of claim 50, wherein each of the plurality of antennas transmits said corresponding ones of the plurality of data symbols on corresponding ones of the plurality of tones and transmits null symbols on the other tones.

58. (Currently amended) The computer program product of claim 50, wherein the first training symbol comprises an OFDM (Orthogonal Frequency Division Multiplexing) training symbol.

59. (Currently amended) A computer program product, tangibly embodied in a machine-readable storage device, the computer program product being operable to cause data processing apparatus to perform operations comprising:

receiving a first training symbol transmitted by a plurality of antennas,

wherein the first training symbol comprises a plurality of data symbols,

wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones, and

wherein each of a plurality of subsets of the plurality of data symbols is received from a corresponding one of the plurality of antennas; and

in response to at least the first training symbol, determining a gain at each of the plurality of antennas for each of the plurality of tones.

60. (Currently amended) The computer program product of claim 59, wherein said determining comprises:

for each of the plurality of antennas, interpolating values for a plurality of said tones from the corresponding plurality of data symbols received from said antenna.

61. (Currently amended) The computer program product of claim 59, wherein said plurality of antennas comprises N antennas, and further comprising:

receiving N-1 training symbols after the first training symbol.

62. (Currently amended) The computer program product of claim 61, wherein each of the first and N-1 training symbols comprises the plurality of data symbols, and

wherein each of said training symbols has a corresponding pattern in which each of the plurality of antennas transmits one of the plurality of data symbols over a different subset of tones than in the other training symbols.

63. (Currently amended) The computer program product of claim 62, further comprising:

receiving each of the plurality of data symbols from each of the plurality of antennas.

64. (Currently amended) The computer program product of claim 63, wherein said determining comprises:

performing an inverse Fourier transform on the plurality of data symbols received from each of the plurality of antennas.

65. (Previously Presented) A system comprising:

a first transceiver comprising

a first plurality of antennas, and

a transmit training module operative to transmit a first training symbol on the first plurality of antennas,

wherein the first training symbol comprises a plurality of data symbols,

wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones, and

wherein each of the first plurality of antennas transmits a corresponding one of the plurality of data symbols; and

a second transceiver comprising

a second plurality of antennas, and

a receive training module operative to receive the first training symbol and to determine a gain at each of the first plurality of antennas for each of the plurality of tones in response to at least the first training symbol.

66. (Previously Presented) The system of claim 65, wherein the transmit training module is further operative to transmit a second training symbol on the first plurality of antennas,

wherein the second training symbol comprises the plurality of data symbols in the first training symbol, and

wherein each of the plurality of first antennas transmits a different one of the plurality of data symbols than in the first training symbol.

67. (Previously Presented) The system of claim 66, wherein the first training symbol has a first pattern in which each of the first plurality of antennas transmits one of the plurality of data symbols on a first subset of tones, and

wherein the second training symbol has a second pattern comprising a shifted pattern of the first pattern such that each of the first plurality of antennas transmits a respective data symbol on a different subset of tones.

68. (Original) The system of claim 65, wherein the plurality of antennas comprise N antennas, and wherein the transmit training module is further operative to transmit N-1 training symbols after the first training symbol.

69. (Previously Presented) The system of claim 68, wherein each of the first and N-1 training symbols comprises the plurality of data symbols, and

wherein each of said training symbols has a corresponding pattern in which each of the plurality of antennas transmits one of the plurality of data symbols over a different subset of tones than in the other training symbols.

70. (Original) The system of claim 69, wherein the receive training module is further operative to receive each of the plurality of data symbols from each of the plurality of antennas.

71. (Original) The system of claim 70, wherein the receive training module is further operative to perform an inverse Fourier transform on the plurality of data symbols received from each of the plurality of antennas.

72. (Original) The system of claim 65, wherein the system comprises an N X N multiple-in-multiple-out (MIMO) system.

73. (Original) The system of claim 65, wherein the first training symbol comprises an OFDM (Orthogonal Frequency Division Multiplexing) training symbol.

74. (Previously Presented) A system comprising:

a first transceiver comprising

a first plurality of antennas, and

means for transmitting a first training symbol on the first plurality of antennas, wherein the first training symbol comprises a plurality of data symbols,

wherein each of the plurality of data symbols corresponds to different ones of a plurality of tones, and

wherein each of the first plurality of antennas transmits a corresponding one of the plurality of data symbols; and

a second transceiver comprising

a second plurality of antennas,

means for receiving the first training symbol, and

means for determining a gain at each of the first plurality of antennas for each of the plurality of tones in response to at least the first training symbol.

75. (Previously Presented) The system of claim 74, wherein the first transceiver further comprises means for transmitting a second training symbol on the first plurality of antennas,

wherein the second training symbol comprises the plurality of data symbols in the first training symbol, and

wherein each of the plurality of first antennas transmits a different one of the plurality of data symbols than in the first training symbol.

76. (Previously Presented) The system of claim 75, wherein the first training symbol has a first pattern in which each of the first plurality of antennas transmits one of the plurality of data symbols on a first subset of tones, and

wherein the second training symbol has a second pattern comprising a shifted pattern of the first pattern such that each of the first plurality of antennas transmits a respective data symbol on a different subset of tones.

77. (Original) The system of claim 74, wherein the plurality antennas comprise N antennas, and wherein the first transceiver further comprises means for transmitting N-1 training symbols after the first training symbol.

78. (Previously Presented) The system of claim 77, wherein each of the first and N-1 training symbols comprises the plurality of data symbols, and

wherein each of said training symbols has a corresponding pattern in which each of the plurality of antennas transmits one of the plurality of data symbols over a different subset of tones than in the other training symbols.

79. (Original) The system of claim 78, wherein the second transceiver further comprises means for receiving each of the plurality of data symbols from each of the plurality antennas.

80. (Original) The system of claim 79, wherein the second transceiver further comprises means for performing an inverse Fourier transform on the plurality of data symbols received from each of the plurality of antennas.

81. (Original) The system of claim 74, wherein the system comprises an N X N multiple-in-multiple-out (MIMO) system.

82. (Original) The system of claim 74, wherein the first training symbol comprises an OFDM (Orthogonal Frequency Division Multiplexing) training symbol.